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10/530,373

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EXAMINER

WINKLER, MELISSA A

ART UNIT

PAPER NUMBER

1709

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/530,373

**Applicant(s)**

CHAMP ET AL.

**Examiner**

Melissa Winkler

**Art Unit**

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/13/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1 – 7, 11, 13 14, 17, and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over WO00/52087 to Hähnle et al. in view of US 4,813,945 to Le-Khac and US 6,033,769 to Brueggemann et al. For convenience, the citations below for Hähnle et al. are from the English-language equivalent of this document, US 6,750,262.

**Regarding Claim 1.** Hähnle et al. teach a water-absorbing foam, also known as a superabsorbent foam (Column 1, Lines 6 – 8 and 11- 14).

Hähnle et al. does not teach a superabsorbent synthetic fiber is present in the composition used to prepare the water-absorbing foam. However, Le-Khac teaches a synthetic fiber that can be incorporated into absorbent articles of manufacture, such as sponges/foams, to enhance their absorbency (Column 1, Lines 9 – 21; Column 2, Lines 7 – 21). Hähnle et al. and Le-Khac are analogous art as they are from the same field of

Art Unit: 1709

endeavor, namely superabsorbent polymer compositions. Brueggemann et al. further provides evidence that incorporation of synthetic fibers in absorbent foams enhances the mechanical stability of these foams (Column 4, Lines 35 – 42). Hähnle et al. and Brueggemann et al. are analogous art as they are from the same field of endeavor, namely superabsorbent polymer foam compositions. At the time of invention, it would have been obvious to a person of ordinary skill in the art to incorporate a superabsorbent synthetic fiber into the composition taught by Hähnle et al. The motivation would have been that including synthetic fibers in the water-absorbing foam provides advantages such as enhancing the water and electrolyte solution absorption capacity and mechanical stability of the final foam product (Le-Khac, Column 1, Line 66 – Column 2, Line 3; Brueggemann et al., Column 4, Lines 35 – 42).

**Regarding Claim 2.** Hähnle et al. teach the superabsorbent foam containing superabsorbent fiber of Claim 1, prepared by foaming a polymerizable aqueous mixture (Column 3, Lines 47 – 48). The aqueous mixture contains monoethylenically unsaturated monomers, designated as group (a) monomers, which have acidic groups which are optionally neutralized (Column 4, Lines 50 – 53). In a particularly preferred embodiment, at least 40 mol% and up to 100 mol% of the group (a) monomers are neutralized (Column 5, Lines 20 – 24). The aqueous mixture also contains crosslinkers

and at least one surfactant (Column 3, Lines 53 and 55). After foaming, the mixture is polymerized to form an expanded hydrogel (Column 3, Lines 64 – 65).

**Regarding Claims 3 and 4.** Hähnle et al. teach the superabsorbent foam containing synthetic fiber of Claim 2 but do not expressly teach its addition in the claimed amount.

Brueggemann et al., however, also teach a polymeric foam composition in which a filler such as synthetic fiber is added in an amount from 0 to 1,000 weight% relative to the water absorbent polymer in the mixture (Column 4, Lines 38 – 49). At the time of invention, it would have been obvious to a person of ordinary skill in the art to add fiber to the polymerizable aqueous mixture in the claimed amount. The motivation would have been that this range would provide advantages such as imparting mechanical stability to the foam (Brueggemann et al., Column 4, Lines 35 – 42) without compromising its absorbent properties.

**Regarding Claim 6.** Hähnle et al. teach the superabsorbent foam of Claim 2, prepared by foaming a polymerizable aqueous mixture (Column 3, Lines 47 – 48). The aqueous mixture contains monoethylenically unsaturated monomers, designated as group (a) monomers, which contain acidic groups which are optionally neutralized (Column 4, Lines 50 – 53). In a particularly preferred embodiment, at least 40 mol% and up to 100 mol% of the group (a) monomers are neutralized (Column 5, Lines 20 – 24).

Art Unit: 1709

The monomers are preferably neutralized with sodium or potassium hydroxide solution (Column 5, Lines 8 – 11).

The aqueous mixture also contains crosslinkers, designated as group (c) monomers, with at least two ethylenic double bonds (Column 6, Lines 1 - 2). Divinylbenzene and diallyl phthalate are two examples cited as suitable cross linkers that contain at least two unsaturated double bonds (Column 6, Line 16).

The mixture also contains polymerization initiators which decompose to free radicals upon polymerization (Column 8, Lines 20 – 24), as well as one or more surfactants (Column 3, Line 55).

After foaming, the mixture is polymerized to form an expanded hydrogel (Column 3, Lines 64 – 65).

While Hähnle et al. does not teach the superabsorbent foam contains a superabsorbent fiber, Le-Khac teaches a synthetic fiber that can be incorporated into absorbent articles of manufacture to enhance their absorbency (Column 1, Lines 9 – 12; Column 2, Lines 7 – 21). Especially preferred by Le-Khac is a synthetic fiber derived from a copolymer of isobutylene/isobutene and maleic anhydride (Column 4, Lines 57 – 58). After the isobutylene-maleic anhydride copolymer is prepared, it is charged with demineralized water in a reactor and heated to about 90°C (Column 10, Lines 49 – 52). Sodium hydroxide is subsequently added to mixture and then propylene carbonate, a

heterocyclic carbonate (Column 10, Lines 52 – 55). Heterocyclic carbonates are indicated to serve a crosslinking function in the invention (Column 5, Lines 52 – 56). At the time of invention, it would have been obvious to a person of ordinary skill in the art to use a fiber derived from isobutylene-maleic anhydride copolymer in the foam taught by Hähnle et al. The motivation would have been that the isobutylene-maleic anhydride copolymer is cited as the most preferable copolymer for forming the fibers taught by Le-Khac (Column 4, Lines 57 – 58). Furthermore, Le-Khac states that these fibers are well suited for incorporation into articles where absorption is desired, as they provide a large surface area for contact with the liquid material to be absorbed and are easily confined within the article (Column 6, Lines 35 – 41).

**Regarding Claim 7.** Hähnle et al. teach the superabsorbent foam of Claim 2 in which the polymerizable aqueous mixture may contain polyvinylamines or polyethyleneimines (Column 7, Lines 11 – 15).

**Regarding Claim 5.** Hähnle et al. teach the superabsorbent foam of Claim 1 wherein crosslinkers are used. In a preferred embodiment, one crosslinker is soluble in water while the other is insoluble (Column 7, Lines 17 – 19). The soluble crosslinker provides for a uniform crosslinking of the polymer (Column 7, Lines 19 – 23). On the other hand, the insoluble crosslinker concentrates in the surfactant interlayer between

the gas phase and the polymerizable aqueous phase, resulting in more extensive crosslinking on the surface than in the interior of the foam (Column 7, Lines 23 – 30).

While Hähnle et al. choose not to employ a cross-linking step subsequent to polymerization, opting to crosslink and polymerize the foam simultaneously for efficiency, such a step has been and may be used (Column 7, Lines 30 – 38).

**Regarding Claim 13 and 14.** Hähnle et al. teach the superabsorbent foam of Claim 1 can be manufactured as a hygiene article. The hygiene article can be used for such purposes as absorption of body fluids and dressing wounds (Column 19, Lines 7 – 11).

**Regarding Claim 17.** Hähnle et al. teach the superabsorbent foam of Claim 1 can be used as sealing or packaging material (Column 19, Lines 15 – 17).

**Regarding Claim 18.** Hähnle et al. teach the superabsorbent foam of Claim 1 can be used as a soil improver/adjuvant (Column 19, Lines 15 – 16).

**Claims 8 – 10 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over WO00/52087 to Hähnle et al. in view of US 4,813,945 to Le-Khac and US 6,033,769



to Brueggemann et al. For convenience, the citations below for Hähnle et al. are from the English-language equivalent of this document, US 6,750,262.

**Regarding Claim 8.** Hähnle et al. teach a process for preparing a water-absorbing foam, also known as a superabsorbent foam (Column 1, Lines 6 – 8 and 11-14). Hähnle et al. further disclose the superabsorbent foam is prepared by foaming a polymerizable aqueous mixture (Column 3, Lines 47 – 48). The aqueous mixture contains monoethylenically unsaturated monomers, designated as group (a) monomers, which contain acidic groups which are optionally neutralized (Column 4, Lines 50 – 53). In a particularly preferred embodiment, at least 40 mol% and up to 100 mol% of the group (a) monomers are neutralized (Column 5, Lines 20 – 24). The aqueous mixture also contains crosslinkers and at least one surfactant (Column 3, Lines 53 and 55). After foaming, the mixture is polymerized to form an expanded hydrogel (Column 3, Lines 64 – 65).

Hähnle et al. does not teach a superabsorbent synthetic fiber is present in the composition used to prepare the water-absorbing foam. However, Le-Khac teaches a synthetic fiber that can be incorporated into absorbent articles of manufacture, such as foams/sponges, to enhance their absorbency (Column 1, Lines 9 – 21; Column 2, Lines 7 – 21). Hähnle et al. and Le-Khac are analogous art as they are from the same field of endeavor, namely superabsorbent polymer compositions. Brueggemann et al. further

Art Unit: 1709

provides evidence that incorporation of synthetic fibers in absorbent foams enhances the mechanical stability of these foams (Column 4, Lines 35 – 42). Hähnle et al. and Brueggemann et al. are analogous art as they are from the same field of endeavor, namely superabsorbent polymer foam compositions. At the time of invention, it would have been obvious to a person of ordinary skill in the art to incorporate a superabsorbent synthetic fiber into the composition taught by Hähnle et al. The motivation would have been that including synthetic fibers in the water-absorbing foam achieves advantages such as enhancing the water and electrolyte solution absorption capacity and mechanical stability of the final foam product (Le-Khac, Column 1, Line 66 – Column 2, Line 3; Brueggemann et al., Column 4, Lines 35 – 42).

**Regarding Claims 9 and 12.** Hähnle et al. teach the process of Claim 8, in which a superabsorbent foam containing synthetic fiber is prepared, but do not expressly teach its addition of synthetic fiber in the claimed amount.

Brueggemann et al., however, also teach a process for making polymeric foam composition in which a filler such as synthetic fiber is added in an amount from 0 to 1,000 weight% relative to the water absorbent polymer in the mixture (Column 4, Lines 38 – 49). (Column 4, Lines 38 – 49). At the time of invention, it would have been obvious to a person of ordinary skill in the art to add fiber to the polymerizable aqueous mixture in the claimed amount. The motivation would have been that this

range would provide advantages such as imparting mechanical stability to the foam (Brueggemann et al., Column 4, Lines 35 – 42) without compromising its absorbent properties.

**Regarding Claim 10.** Hähnle et al. teach the process of Claim 8 wherein the foaming occurs as the aqueous polymerizable mixture is first charged under a pressure of 2 – 400 bar with an inert gas and then decompressed to atmospheric pressure (Column 11, Lines 62 – 67 and Column 12, Lines 18 - 19).

**Claims 15, 16, and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over WO00/52087 to Hähnle et al. in view of 4,813,945 to Le-Khac and 6,033,769 to Brueggemann et al, as applied to Claim 1 above, and further in view of US 6,136,873 also to Hähnle et al. For convenience, the citations below for WO00/52087 to Hähnle et al. are from the English-language equivalent of this document, US 6,750,262.

**Regarding Claims 15 and 16.** US 6,750,262 to Hähnle et al. teaches the composition of Claim 1 but does not expressly indicate it can be used to dewater liquids.

However, US 6,136,873 to Hähnle et al. also describe a water-absorbing, expanded crosslinked polymer compositions comprising monoethylenically unsaturated monomers. In this patent, Hähnle et al. state that composition is useful in

dewatering sludges and oils containing water (Column 15, Lines 34 – 36 and Lines 41 – 43). US 6,750,262 to Hähnle et al. and US 6,136,873 to Hähnle et al. are analogous art as they are from the same field of endeavor, namely water-absorbing, expanded crosslinked polymer compositions. At the time of invention, it would have been obvious to a person of ordinary skill in the art to use the claimed composition taught by US 6,750,262 to Hähnle et al. to dewater a liquid. The motivation would have been that the foam would be ideal for removal of unwanted water in liquids, given its demonstrated water absorption capacity.

**Regarding Claim 19.** US 6,750,262 to Hähnle et al. teaches the composition of Claim 1 but does not expressly indicate it can be used to thicken a liquid.

However, US 6,136,873 to Hähnle et al. discloses a significantly similar composition and indicates that such a composition can be used to thicken water-based surface coatings. For example, the superabsorbent foam in powder form can be added in powder form to the water-based surface coating until solidification occurs (Column 15, Lines 34 – 41). At the time of invention, it would have been obvious to a person of ordinary skill in the art to use the claimed composition taught by US 6,750,262 to Hähnle et al. to thicken a liquid. The motivation would have been that the foam is easily added to a liquid, where its water absorbent properties can be exploited for

Art Unit: 1709

removing water from the liquid and thereby increasing its thickness, until the liquid has attained its desired consistency.

*Prior Art*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

*Correspondence*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Winkler whose telephone number is (571)270-3305. The examiner can normally be reached on Monday - Friday 7:30AM - 5PM E.S.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571)272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MW *mw*  
September 14, 2007

  
MARK EASHOO, PH.D.  
SUPERVISORY PATENT EXAMINER

17/Sep/07